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# ESIR

**Combining  
Regional  
Strengths to  
Narrow the EU  
Innovation Divide**

**Policy Brief No. 7**

Independent  
Expert  
Report

## Combining Regional Strengths to Narrow the EU Innovation Divide

### ESIR Policy brief

European Commission  
Directorate-General for Research and Innovation  
Directorate G —Common Policy Centre  
Unit G.1 — Common Strategy & Foresight Service  
Contact César Dro  
Email [cesar.dro@ec.europa.eu](mailto:cesar.dro@ec.europa.eu)  
[RTD-ESIR@ec.europa.eu](mailto:RTD-ESIR@ec.europa.eu)  
[RTD-PUBLICATIONS@ec.europa.eu](mailto:RTD-PUBLICATIONS@ec.europa.eu)

European Commission  
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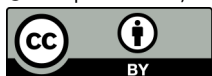
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# Combining Regional Strengths to Narrow the EU Innovation Divide

***A policy brief by the Expert Group on the  
Economic and Societal Impact of Research and  
Innovation (ESIR)***

Katherine Richardson (Chair)  
Andrea Renda (Vice-Chair)  
Pierre-Alexandre Balland (Rapporteur)  
Marialuisa Castaño Marin  
Bianca Muntean  
Marzenna Weresa  
Kirsten Dunlop  
Dunja Potočnik  
Epaminondas Christophilopoulos  
Rainer Walz  
Heather Grabbe  
Floor Alkemade  
Paweł Świeboda  
Jean-Francois Huchet  
Jon Simonsson

# Contents

|   |           |
|---|-----------|
| <b>1. Introduction</b>                                    | <b>3</b>  |
| <b>2. EU innovation activity is highly concentrated</b>   | <b>3</b>  |
| <b>3. The innovation divide is not a European problem</b> | <b>5</b>  |
| <b>4. Building and combining regional strengths</b>       | <b>8</b>  |
| <b>5. Conclusion</b>                                      | <b>15</b> |

## 1. Introduction

*The European Union faces critical challenges related to a strong innovation divide among its Member States and regions. These disparities can potentially undermine the EU's global competitiveness, the ability to address pressing societal challenges and can lead to massive citizen discontent due to the feeling of being left behind. The central question addressed in this brief is: what is the innovation divide and when does it become a societal challenge that needs to be addressed with policy?*

*We show that there are substantial differences in innovation performance between EU regions but argue that spatial concentration of innovation and the existence of hubs is a general and global pattern. We argue that we need to shift the focus of the discussion towards supporting every EU region to realize its potential and play a role in the overall EU system of innovation. In short, we need to build on regional strengths and combine them. This policy brief also outlines strategic recommendations to reduce negative impacts and foster a more balanced innovation landscape across the EU.*

## 2. EU innovation activity is highly concentrated

In its most simple definition, the EU innovation divide could be defined as the persistence of significant variations in innovation performance among Member States and regions. Innovation performance is difficult to assess intuitively because innovation is global and spans hundreds of thousands of technologies and processes. It is also difficult to quantitatively measure innovation performance. However, it is possible to get a useful estimate of this performance by analysing different indicators such as the number of new patents, venture capital investments, research and development expenditures, high-skilled migration flows, the number of (high-impact) scientific publications, migration of knowledge, the percentage of GDP from knowledge-intensive services, the percentage of exports that are high-tech, or the proportion of the workforce involved in science and technology fields. These indicators give slightly different pictures but convey the same clear message that **there are strong variations in innovation performance among European Member States and regions.**

One of the most comprehensive and periodic indicator series that attempts to put several innovation performance indicators together is the European Innovation Scoreboard (EIS). This is one of the main tools used by the European Commission to monitor innovation results at the national level, while the Regional Innovation Scoreboard (RIS) focuses on the regional level. These rankings enable an analysis of the relative innovation performance of each territory, providing insight into the health of different innovation systems in relation to each other. Figure 1 below shows a map of EU regions according to the RIS 2023, in which several innovation performance indicators are grouped into a synthetic index to generate an overall ranking of different regional innovation systems. **It is clear that significant differences in regional innovation performance still remain.**

The top five regions that are innovation leaders (Hovedstaden in Denmark, Helsinki-Uusimaa in Finland, Oberbayern in Germany, Stockholm in Sweden, and Berlin in Germany) have high levels of R&D investment, skilled workforces, and vibrant ecosystems for entrepreneurship and innovation. In contrast, 64 European regions lag behind and perform below 70% of the EU average. Over 95% of the regional Emerging Innovators belong to EIS Moderate Innovator and Emerging Innovator countries. They are located in South Eastern Europe (Sud-Est, Sud-Vest Oltenia, Sud – Muntenia in Romania and Severozapaden, Yugoiztochen in

Bulgaria) struggling with limited resources, infrastructure deficits, and weak institutional support for innovation (European Commission, Hollanders & Es-Sadki, 2023).

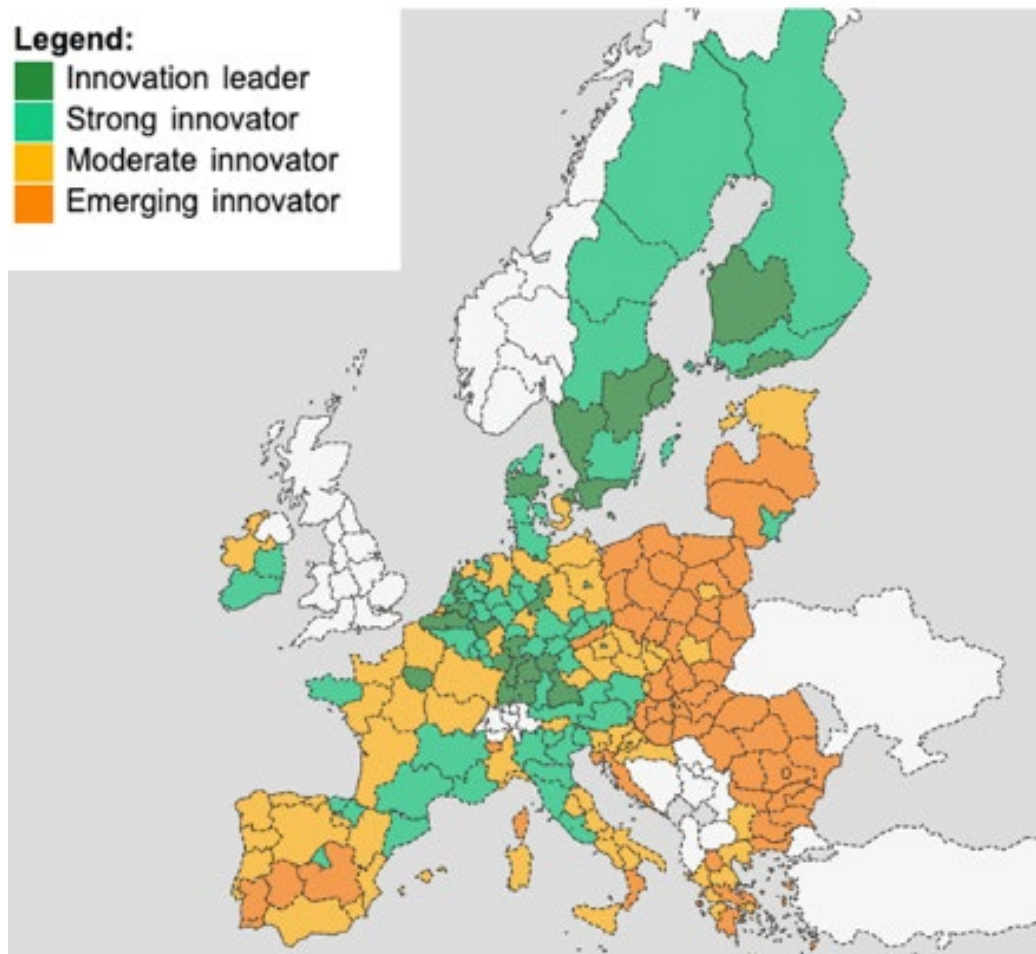


Figure 1 - Regional Innovation Scoreboard 2023

There have been significant EU efforts to address these disparities through various initiatives and funding mechanisms, such as the Widening Participation and Spreading Excellence Programme (WIDERA), structural funds aimed at enhancing regional innovation capacities, and the Erasmus programme. But whether the innovative divide is widening or not is still debated. Weresa et al. (2022), for instance showed a decrease in the value of standard deviation for the Regional Innovation Index (RII) from 2014–2021 - indicating that, across the board, less innovative European regions have been catching up with more innovative regions. While there has been **noticeable progress in narrowing the innovation divide** in some indicators, particularly in human capital development and digital infrastructure, **significant disparities remain in high-impact indicators** like R&D expenditure, VC investments, patent filings (especially in the most sophisticated technologies), and high-tech exports.

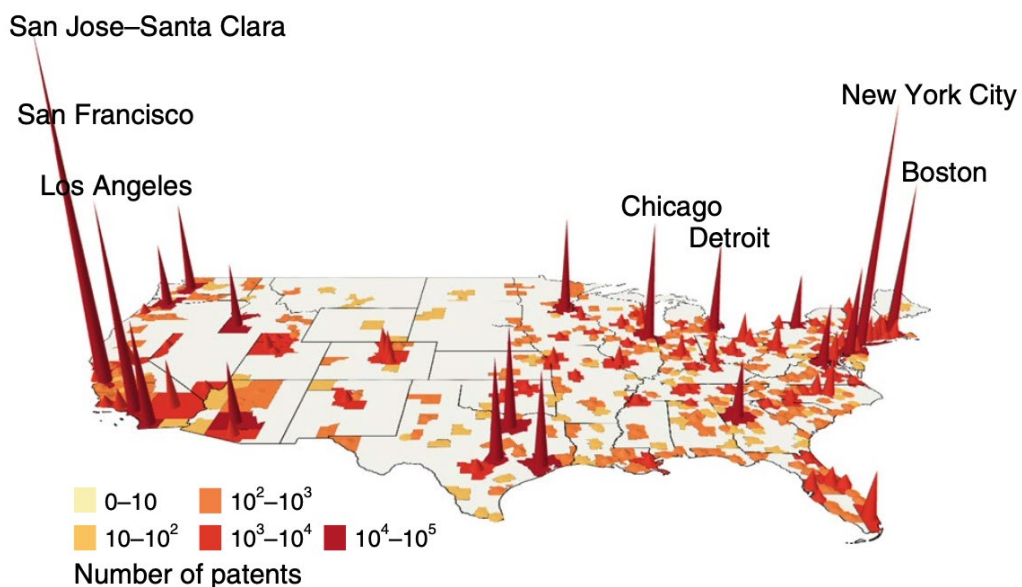
The innovation gap between European regions is also influenced by the historical challenges and timing of countries' accession to the EU. Some areas have had a more favourable context due to the advance in European integration. At the same time, innovation support was on the side-burner both in pre-accession and in accession funds, leading to disparities in access to resources and investment, which has fuelled the innovation divide. Newer EU Member States face unique challenges due to fragmented resources and different periods of development, preventing them from catching up with established counterparts. Tackling this issue requires targeted support and investment. It also requires more capacity-building efforts on the part of regional entities that are in charge of boosting innovation.

To address the innovation divide we will also need to consider additional challenges that emerged due to Russia's invasion of Ukraine. In particular, the regions in Poland, Slovakia, Hungary and Romania located on the EU's external borders have been affected. These regions were strongly exposed to the flow of refugees, while the majority of these regions are less innovative or transition regions. There is a risk they turn into 'left-behind places' (Rodríguez-Pose, 2017).

**The fact that European innovation is so highly concentrated begs three main questions. First, is this innovation divide a specific EU issue or a general and global pattern of innovation activities? Second, is it possible and relevant to dedicate massive resources to fully bridge this divide? Third, what concrete actions can we take to narrow this divide and strengthen a true pan-European system of innovation?**

### 3. The innovation divide is not a European problem

**The very strong concentration of innovation activities is a general and global phenomenon.** A similar pattern can be observed in the US, China, South America and Africa. In fact, this concentration pattern of innovation activities is so strong and regular that there is an entire scientific field dedicated to understanding its root causes and implications. The field of the geography of innovation has documented this phenomenon over the past two decades in both global and country-level contexts (Audretsch and Feldman, 1996; Sachs, 2003; Crescenzi et al., 2007; Kong et al., 2017; Kowalski, 2021) as well as from regional perspectives (e.g. Weresa et al., 2022) including rural-urban gaps in innovation (e.g. Aryal et al., 2020). So what do we know from the literature? We know that innovation concentrates more than any other economic activity. We also know that innovation concentrates to a very large extent in large and wealthy cities. Tokyo, Seoul, San Francisco, Paris and Osaka - just 5 cities - alone account for more than 20% of all new inventions granted by the European Patent Office (Paunov et al., 2019). This is a surprisingly high number and if most innovation comes from a handful of cities, then it means that most parts of the world have a very low innovation activity. This is also true within countries. Figure 2 below is a spiky map that shows the extreme concentration of innovation activity in the US as measured by patent documents (Balland et al., 2020). We see very few high spikes that concentrate most innovation activity and most places with very low activity. Figure 2 is a representation of Richard Florida's spiky world and spiky maps in general give a more realistic perspective on the innovation divide than flat choropleth maps such as Figure 1.

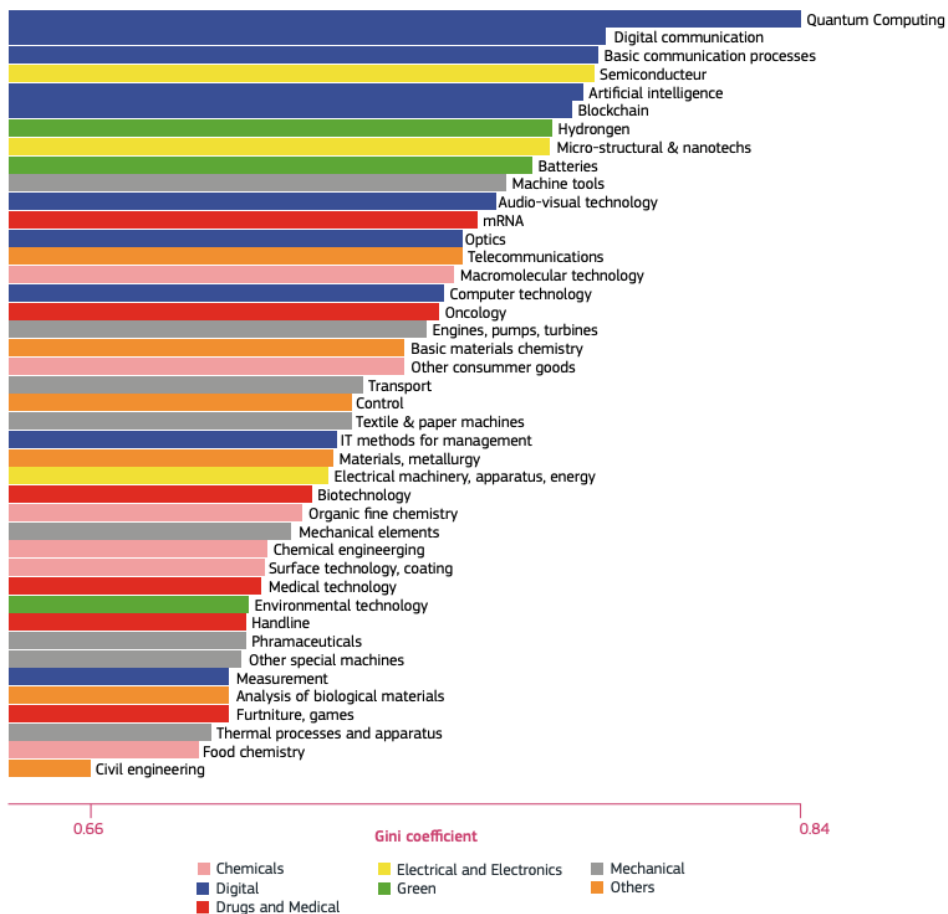


**Figure 2 - Innovation concentration in the United States (Source: Balland et al., 2020)**

**The reason why we observe such a general and global concentration of innovation activities is that there are very strong underlying economic forces.** This generates agglomeration externalities by sharing costly infrastructures, matching specialized professionals with cutting-edge organizations, and providing multiple learning channels (Duranton and Puga, 2004). These agglomeration externalities are the cornerstone of global competitiveness. Innovation thrives with proximity (Boschma, 2005), and that, in turn, creates innovation gaps. Overall, the places that have a strong system of innovation and a hospitable business environment operate as magnets. They attract talent, capital, and ideas, which in turn attracts more talent, capital, and ideas. This self-reinforcing feedback loop creates the long-lasting innovation divides we observe. So, despite the perspective considered, the majority of analyses highlight structural factors as the primary drivers of innovation concentration and divide (Cincera & Veugelers, 2013; Kowalski, 2021).

Aggregate outputs and rankings such as the regional innovation scoreboard presented in Figure 1 (previous section) are informative but also have limitations. They average everything out. **Another finding of the literature is that different technologies have different levels of spatial concentration.** The most complex technologies tend to be the most concentrated ones. The figure below, taken from the 2022 Science, Research and Innovation Performance of the EU Report (SRIP) shows that technologies such as quantum computing, semiconductor, or AI tend to display a much stronger degree of spatial concentration than technologies such as food chemistry, civil engineering, or thermal processes and apparatus. This is a very important point when thinking about the innovation divide because some technologies are, by definition, more transformative than others and will have stronger economic impact.





Science, Research and Innovation Performance of the EU 2022

Figure 3 - Spatial concentration of key technologies in Europe (source: SRIP 2022)

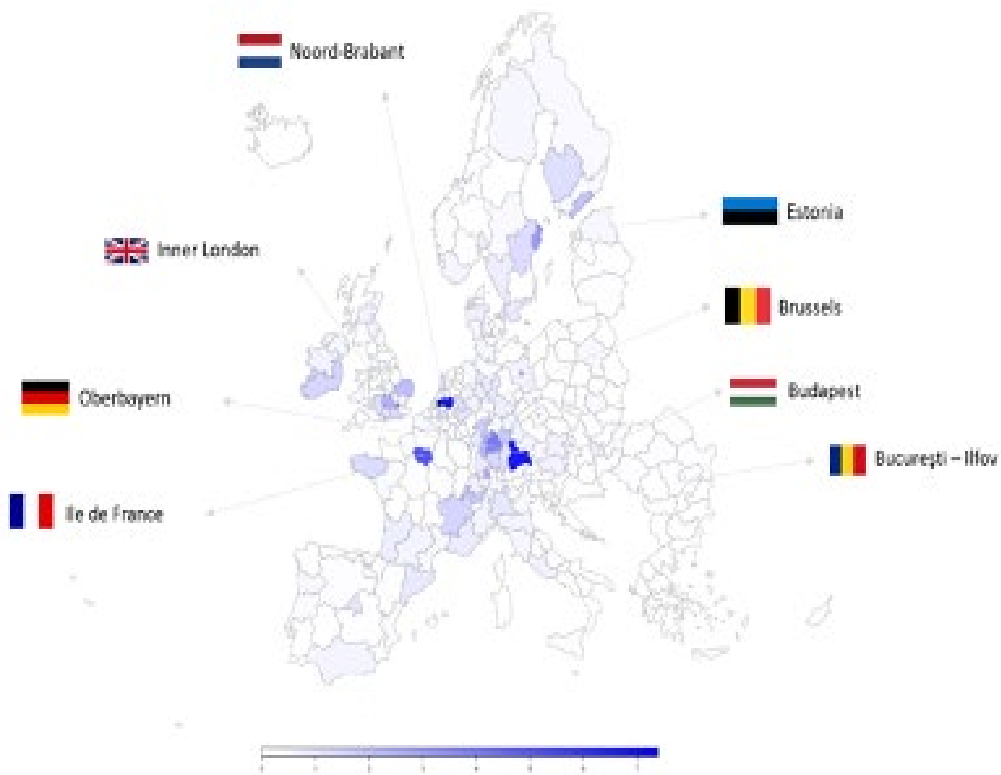
**A complex innovation system needs hubs to function efficiently.** This is because when the number of elements grows and becomes more interdependent - as a result of technological change and globalization - we observe the formation of innovation hubs (Balland, 2022). This is actually a general characteristic of complex systems (Watts and Strogatz, 1998). A direct flight between two small cities would never be financially sustainable, but traveling through a central airport hub allows you to reach pretty much any destination in very few steps. This is the same with freight distribution where a central warehouse receives goods and redistributes them to retail locations. This structure is a very efficient way to organize large flows of goods, people, ideas and information. Therefore, as we need Heathrow and JFK, we need innovation hubs such as the Silicon Valley and the Paris AI cluster. Beneath the surface, this is because the amount of links grows (nearly) exponentially to the number of elements in a system of innovation so hubs allow to keep a low average path length while keeping the link cost down. Let's say we have 5 inventors. The number of links to have a fully connected network is 10. That is doable. Now let's say we have 5000 inventors. A fully connected network would have more than 12 million links and

each individual would have 4999 direct connections. The only way to have an efficient knowledge flow in an innovation system is to have hubs.

**Innovation hubs are a necessary condition to EU competitiveness, and trying to flatten the innovation system would be a policy mistake. We need to shift the focus of the discussion towards supporting every EU region to realize its potential and play a role in the overall EU system of innovation. We will not narrow the innovation divide by eliminating hubs but by combining regional strengths.**

#### 4. Building and combining regional strengths

Instead of trying to flatten existing hubs by dispersing funding, **a first objective should be to support the emergence of new innovation hubs.** There are European regions that show strong potential to become leaders in a specific field but are currently underperforming. The key here is to use the right metrics to spot innovation gaps, understand specific enablers and blockers and then substantially invest to close them. This approach simultaneously addresses the innovation divide while enhancing EU competitiveness and market development based on innovation and R&D. **In order to work, these emerging innovation hubs need to truly build on existing strengths and attempt not to build innovation cathedrals in a knowledge desert.** This requires a sound way to evaluate and monitor the existence of fundamentals and structural characteristics and design investment programmes that specifically target promising hubs with high orientation to competitive markets and emerging technologies and methods. Future potential excellence should be the key deciding factor, but ideally, these hubs should also be aligned with European policy priorities such as the green and digital transition. The figure below, for instance, shows promising areas of specializations of some Eastern European regions in the field of Artificial Intelligence as noted in a previous ESIR policy brief. In relative terms - as measured by the revealed comparative advantage - the Bucharest region, Estonia, and the Budapest region show significantly above-average shares in AI patents compared to other European regions. These promising hubs need to be nurtured. Since innovation tends to diffuse locally, these promising hubs can also - as with the airport and warehouse example above - later facilitate diffusion to smaller (and often less urbanized) regions.



**Figure 4 - Share of AI patents in European regions (source: ESIR AI focus paper)**

Due to the structural nature of the innovation system **not all European regions can be innovation hubs, but all regions have a role to play in the EU innovation system**. Not all regions can have an airport the size of Schiphol (Amsterdam) but all can contribute to human mobility by taking part in the transport system even for the last mile. By the same token, all regions need to participate in solving the EU's grand challenges. Having some regions further falling behind the innovation frontier and a growing innovation divide undermine the EU's global competitiveness and its ability to address pressing societal challenges. A key principle to include is to avoid all regions prioritizing the same small set of trendy technologies. Instead, each regional innovation strategy should be tailor-made to the specific strength of the innovation ecosystems. This applies to hubs, but also to every other region.

**We can leverage regional strength with smart specialization principles.** The key here is to prioritize the sets of technologies or product categories that best fit the regional ecosystem while also upgrading the innovation capabilities. This is the core principle of the smart specialization strategy. The initial idea can be traced back to the work of the Knowledge for Growth expert group (Foray, David, & Hall, 2009), which was at the time advising DG RTD (research and innovation). Therefore in essence it truly is an innovation policy framework. **The core principle was to move away from the traditional approach of spreading investment thinly across several sectors and technologies and instead prioritize some fields and “go big”.** A smart specialization strategy emphasizes the importance of regions identifying niche areas of comparative advantage and potential technological or industrial specializations where they can excel on a global scale. DG RTD supported the theoretical development of the principles but it never translated into a substantial regional innovation

policy programme. At least not at the scale of what can be seen in the United States or China. As the concept matured and demonstrated potential, DG REGIO adopted smart specialization as a key mechanism for regional development. This was particularly influential in the context of the European Structural and Investment Funds (ESIF), especially for the European Regional Development Fund (ERDF). Starting with the 2014-2020 funding period, DG REGIO made it mandatory for all EU regions to develop a Smart Specialization Strategy as a prerequisite for receiving ERDF funding for research and innovation activities. This was a significant shift as it linked the receipt of substantial EU funding to the existence of well-defined strategic priorities. Smart specialization principles are very powerful, theoretically grounded and evidence-based. It is excellent practice to apply them in the context of cohesion policy. By nature, that means that they are more oriented towards less economically developed regions, which is not where most innovation happens. **Therefore it is urgent to deploy smart specialization principles into the R&I framework of the EU and develop an ambitious regional innovation policy.**

**Although there is a consensus in the literature that the smart specialization principles allow for very efficient use of public resources**, practitioners note that implementation and monitoring are difficult. In Central and Eastern European countries in particular, smart specialization is still often perceived as a mere tick-box item rather than a comprehensive strategy for fostering innovation. It is used at a regional level for promoting funding opportunities, by encouraging applications from S3 industries, but its impact is not monitored precisely apart from the funding disbursed for specific industries. This perception underscores the need for greater awareness and understanding of the benefits of smart specialization. Additionally, S3 strategies are - in practice - still not well correlated with socio-economic realities and, hence, funding opportunities are not well harnessed. In the logic of the value chain participation, this also means that regions miss out on opportunities while focusing on several big-ticket items (such as AI in general), instead of looking for their actual comparative advantages.

**So, how to identify innovation opportunities in regions?** As we see, there is a gap between theory and practice. This is because systematically identifying innovation opportunities is not an easy task, but similar algorithmic principles that govern Amazon, Netflix or Spotify prediction machines can also be applied to the prioritization of investment decisions in research and innovation policy. Balland et al. (2019) proposed such a **framework for smart specialization around the concepts of relatedness** (Hidalgo et al., 2018; Balland et al., 2021) **and technological complexity** (Balland & Rigby, 2017; Hidalgo & Hausmann, 2009). In a similar fashion that some languages are more related to each other (such as Italian and Spanish), some technologies tend to require similar skills (such as the internet of things and cybersecurity). One of the key findings in innovation studies and economic geography is that regions develop new products and technologies by recombining pre-existing and related available capabilities. Mapping existing capabilities in a region allows estimating the distance with any new domain, measured by the concept of relatedness density. In summary, relatedness density captures the fitness of a regional ecosystem around a specific technology - or how easy it is for a region to develop it. It is an indicator of cost. Complexity is a technology (or product) level indicator and captures potential economic value. Complex products have high barriers to entry, grant more pricing power and margins, and require interdependent supply chains, and adaptation capacity.

The graph below (Figure 5) shows this framework at play for the NUTS2 region of Bucharest for twin transition technologies. **The top right quadrant is where most technological opportunities and regional strengths are.** It shows for instance that Bucharest has a relatedness density of 70% around cybersecurity, which is very high. It means that Bucharest has a comparative advantage in 70% of the technologies related to cybersecurity and is a predictor of further specialization (such as the Netflix matching algorithm). Cybersecurity is



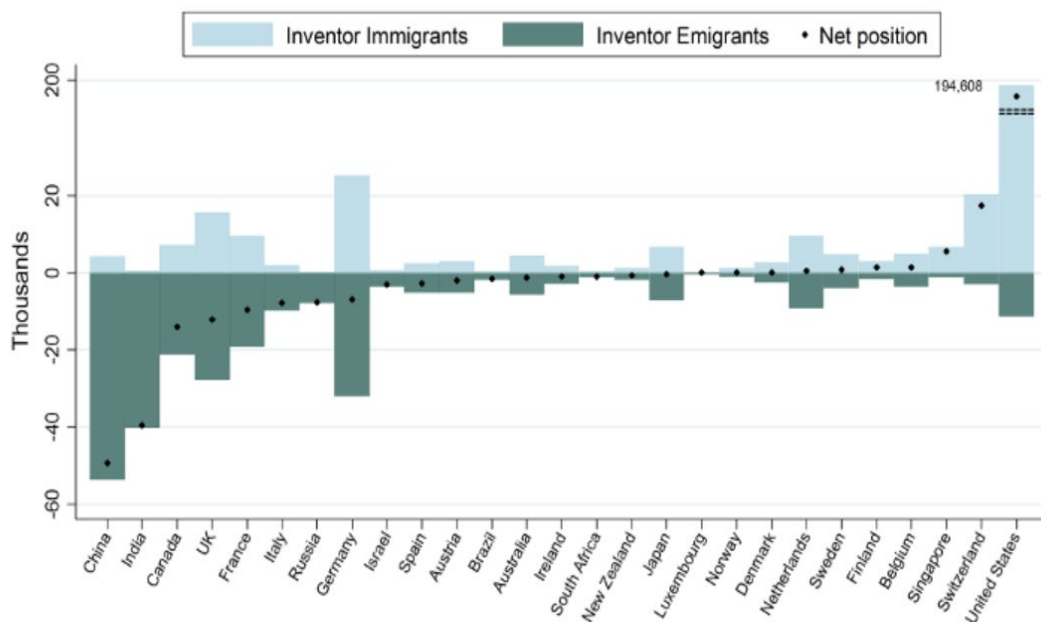
been proposed is the European Universities initiative that can connect such knowledge hubs and probably even attract talent in diverse places.

Balland and Boschma (2021) offer a complexity-based methodological framework to assess complementarity potential between different regions. This approach has the advantage of building EU competitiveness while reducing disparities by allowing less developed areas to learn from and link up with more established hubs. But it is also clear that many of today's challenges, such as climate change, health pandemics, or the twin transition, require global solutions that can be more effectively addressed through connecting hubs. There is strong evidence that EU regions are not connected enough and suffer from a very strong national bias, as evidenced in the case of AI by ESIR<sup>2</sup>.

What comes with connecting hubs is not only the movement of knowledge (Letta, 2024) but also the movement of people. **The circulation of high-skilled talent within Europe is crucial for reducing innovation disparities, as it promotes knowledge transfer, diversifies skills across regions, and overall mobility stimulates economic competitiveness.** We know that a huge factor of American competitiveness is the ability to attract the world's talents. Figure 6 below shows that the US is able to import much more talent than it exports, while for most European countries and China, this is the other way around. However, managing talent mobility also requires careful strategies for the situation where skilled professionals emigrate in large numbers from one region or country, potentially depriving the origin region of expertise and economic potential. This brain drain, as outlined in the Impact of the [Brain Drain - EU Demographic Scenarios](#), can then exacerbate the innovation divide. It also leads to demographic change, aging populations and reduced productivity potential in regions experiencing high levels of emigration. It also creates a skills mismatch at a regional level, which only exacerbates regional challenges. This challenge is particularly difficult to overcome considering that the cornerstone of the EU is the freedom of movement of persons. Nevertheless, the particularity of this challenge is that it involves not only the modest innovator regions but also the Western regions, which are confronted with the brain drain to other regions of the Globe (as also shown in Figure 6).

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<sup>2</sup> Expert Group on the Economic and Societal Impact of Research and Innovation, A European Model for Artificial Intelligence, upcoming 2024



**Figure 6 - Immigrant and emigrant inventors 2001-2010 (Source: Miguelez and Fink, 2013)**

**In addition to creating a supportive ecosystem for innovation and competitiveness, citizens' and youths' engagement and education is also key.** Fostering an interest in science and embracing technological advancement are also fundamental factors in attracting skilled individuals to careers in research and development. The European Union promotes science through measures aiming at bridging the gap between scientists and the general public, encouraging a culture of curiosity and critical thinking, and promoting informed decisions on science-related issues, such as Horizon Europe dissemination and communication activities, the European Researchers' Night and other science festival and events, science communication networks, science education initiatives, science media centres, and citizen science projects. Still, all these actions may not suffice to elevate the citizens' interest in science, especially the younger ones. The general trend established by the ROSE (the Relevance of Science Education) research (Schreiner and Sjøberg, 2019) suggests that young people are less interested in science the more economically prosperous the country is. Results of the ROSE research and awareness of some negative impacts of the predominance of digital means in formal education imply that early intervention programmes must be employed, especially if the developmental stages of children and youth are taken into account.

It is increasingly important to support the development of key enabling technologies. How can we create more equal innovation opportunities if there is such a gap in access to tools? All EU regions, and in particular lagging regions need to have an adequate level of these technologies (an access and ability to use these technologies). Therefore, the focus should be on reducing the digital divide among the regions in the EU.

In the previous ESIR publications on education, the importance of all levels of education was acknowledged, but the focus remained on higher education, while the lower levels of education were mainly elaborated on only in the context of digitalisation. However, when it comes to developing professional aspirations, most children around the age of ten reject areas in which they are not interested or are deemed too challenging. **These implications suggest it is important to develop science popularisation activities for children at an early age, even in the preschool years.** Such early interventions should be coupled with more diverse and fine-tuned science popularisation activities targeting a wider population. This premise is backed by the Special Eurobarometer 516 on European citizens' knowledge and attitudes towards science and technology (2021).

In today's complex and rapidly changing world, education and the fight against pseudo-science are recognized not as panaceas, but as facilitators of steady transformations. They serve as pillars for societal progress, enabling individuals and communities to navigate the challenges brought about by economic growth and technological advancement. However, merely focusing on education is insufficient. **It must be coupled with capacity-building initiatives that empower individuals to critically engage with information, fostering trust towards science and scientists.** Embracing changes in educational paradigms is essential, particularly in the context of diffusion and dissemination of knowledge. Pseudo-science, often fuelled by anxiety stemming from economic and technological shifts, poses a challenge to scientific integrity. Therefore, supporting fair access to quality education programmes is crucial. These programmes should emphasize critical thinking, problem-solving skills, and the potential for careers in science and technology, ensuring that all individuals have equal opportunities to contribute to and benefit from scientific advancements.

While education and community programmes play a significant role, it is essential to recognize that other issues such as corruption persist in various forms. Although it cannot be entirely eradicated, promoting the message that science is a low-corruption area can help mitigate its impact. **In fact, to reduce the innovation divide it is key to provide pro-innovation regulatory environments integrated with other policy areas such as combating fraud and education.** Additionally to the already mentioned hindrances to elevating innovation and competitiveness of the European Union, there are a number of administrative obstacles for innovation to thrive. Differences in regulatory frameworks and national/local government policies can significantly affect innovation. Regions with proactive innovation policies that include incentives for research and support for startups are needed. It is imperative that Europe adopt a modern, innovative regulatory framework. New regulatory frameworks are necessary to support new business models, information and platform economics and highly intensive data and AI technologies and products. It would be beneficial if the European institutions were able to ensure that Member States subscribe to a bigger vision and are provided with the means, not only the financial means but also political support and internal coherence between the supranational actions and those on the national level.

In line with this presumption, the European Round Table for Industry has made a series of recommendations to policymakers to create the conditions for faster and more ambitious innovation in European regions. The following three recommendations are of the highest priority. First, regulation should be rethought. Until EU decision-makers place the business case for innovation and investment in Europe at the core of EU regulation, Europe cannot be a frontrunner in innovation. Second, to create robust intellectual property rights and international standardization. For the business case of innovation, strong, globally competitive intellectual property rights are essential. Third, the scale-up of innovations



requires a significant investment and adequate business models. It is essential that we de-risk technology development in order to move forward with the green and digital transition. It could be accomplished through public-private partnerships and innovation-oriented public funding.

As discussed before, there will always be innovation hubs in Europe, and therefore gaps in innovation. What is important is that all regions manage to realize their potential. But clearly, completely eliminating the innovation gap is not a realistic policy objective. **What is unacceptable, however, is that all socio-economic benefits are captured by the innovation hubs.** We need to actively focus on redistributing the benefits of innovation more equitably and enhancing access to innovative technologies and practices. For that, it is important to put in place measures to ensure that all communities, regardless of their geographical or socioeconomic status, can access new technologies and innovative processes. This diffusion initiative involves implementing targeted policies that support education and training in underrepresented areas, improving infrastructure to facilitate better access to digital resources, and fostering inclusive environments that encourage diverse participation in the innovation economy. Ultimately, while the root causes of the innovation divide may persist due to structural factors, their negative impact can be significantly reduced through inclusive policy interventions and targeted European reforms.

**These actions are especially important to avoid innovation gaps that translate into places left behind** (Dijkstra, Poelman, and Rodríguez-Pose; 2020). The feeling of lacking opportunities and future prospects leads to a geography of EU discontent, and recently the places that 'don't matter' have increasingly switched to extreme right/left voting behaviours as seen with the Brexit vote, the 2016 Austrian presidential election, or the 2017 French presidential and German general elections. It has sometimes led to plain revolts, for instance with the 'gilets jaune' movement in France. **We need to make sure that the geography of innovation does not lead to a geography of EU discontent.**

## 5. Conclusion

In this brief, we showed that there are strong and persistent variations in innovation performance among European Member States and regions. This can be perceived as negative, but spatial concentration is a general characteristic of the innovation process at the global scale. The existence of hubs provides an efficient innovation system and is also positive for EU competitiveness<sup>3</sup>. This should not be a policy objective to avoid the formation of hubs per se but we should in some instance mitigate the negative impact of spatial concentration.

The level of interventions matters. The innovation divide stems from structural factors and the research shows that it is inherent in multiple other places around the Globe. The US, for instance, has a working internal market and a coherent industrial policy, while the EU lags in this respect. In this sense, intervention to mitigate this divide should go both ways - at the top level - with reforms to the EU competences that would trigger new policy tools at a regional level with adequate mechanisms to distribute innovation benefits and integrate hubs better.

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<sup>3</sup> Expert Group on the Economic and Societal Impact of Research and Innovation, Why Europe needs a systemic R&I policy : Redefining competitiveness and consequently R&I goals, upcoming 2024

Now, more specifically, what is negative and what needs to be solved with policy actions? First, it is the dynamic inability of promising regions to become hubs. Enabling conditions need to be established and barriers removed to fully realize innovation potential in Europe. It is clear, for instance, that several Eastern EU regions have a strong role to play in the digital transition. For that, we need a strong regional innovation policy that identifies untapped potential and actively invests to reduce the gaps.

Second, for all regions, we need to fight the tendency to spread investments too thinly and “chase the hype”. This, in itself, would reduce the innovation divide - since the least developed regions tend to be the ones that also shoot too far from their knowledge base. We need tailored innovation strategies that leverage regional strength with smart specialization principles. The key here is to prioritize the sets of technologies or product categories that best fit the regional ecosystem while also upgrading the innovation capabilities. We discussed how this can be achieved with an evidence-based framework.

Third, we need to solve the isolation of peripheral regions. A major lever to reduce the innovation divide is to connect innovation hubs to other hubs and smaller innovation ecosystems. Fourth, we need to promote the circulation of high-skilled talent within Europe while carefully considering the possibility of brain drain. Fifth, we need to create a supportive ecosystem for innovation and competitiveness, citizens’ engagement and education. Sixth, we need to provide pro-innovation regulatory environments.

All these six actions are about building and combining regional strength to make sure all regions play a role in the EU innovation system. But even with perfect execution, there will always be hubs. New ones, but still a hub structure instead of a point-to-point one. This is why we also need strong action to spread the socio-economic benefits of innovation. **We need to make sure that the geography of innovation does not lead to a geography of EU discontent.**

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This policy brief by the ESIR group discusses the regional innovation divide in Europe and the world. It outlines the main causes for the concentration of innovation in hubs, which are necessary for a strong innovation environment. However, such concentration should not come at the expense of the regions incapable of creating such concentration, which should synergise with the innovators using innovation-oriented smart specialisation strategies. It also recommends for these strategies to be accompanied by a holistic effort to integrate other policies such as skills and redistribution.

*Research and Innovation policy*

